

Introduction to the Network Analysis of Digital and Social Media Minitrack

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Social networks are representation of complex systems defined by the patterns of relationships among a system's components. Networks are created by information flows or other relations among entities through time and space. The goal of network analysis is to describe the structure of a higher-level system based on the pattern of linkages among a set of lower level nodes, and how this structure changes over time. It differs from traditional research by focusing on relationships rather than the attributes of individuals. The complex social networks that people create and manage are dynamic, multi-modal, and increasingly mediated by social and digital media.

Network science has progressed in parallel with the development of social and digital media, computers and other information systems. This has provided social and communication network scientists with precise representations of information flows and advanced the state of the science. Additionally, the increased theoretical understanding and analytic representation of computer and information systems provides developers with a greater sense of how people and organizations utilize technology to manage resources embedded in their social and digital networks. The papers in this minitrack represent theoretical and analytic developments in social and digital media research. They focus on new media and information technology, or use new media data in the analysis. They cross disciplines and levels of analysis, using novel approaches to discover aspects of digital networks.

In *Press Freedom Homophily in the Tie Structure of the Global Internet*, Hyunjin Seo and Stuart Thorson investigate how different country-level variables account for the pattern of direct country-to-country Internet connections using Exponential Random Graph Models. They found that press freedom homophily is significantly predictive of the presence of country-to-country Internet connections while controlling for other factors. These results provide insight into how press freedom around the world has been evolving with global Internet structure.

In *Sampling Social Media: Supporting Information Retrieval from Microblog Data Resellers with Text, Network, and Spatial Analysis*, Cody Buntain, Erin McGrath, and Brandon Behlendorf study the problem of how to efficiently and effectively identify relevant information given the massive amounts of available social media data. They present a flexible method of combining human input and machine learning to implement a framework that optimizes sampling for social science research. The communication during elections in six Sub-Saharan African countries on Twitter is used as an example.

In *Emerging Leaderships in an Online Community: A Longitudinal Network Analysis*, Joyce Lee, Chin-Sheng Yang, Carol Hsu, and Jhong-Heng Wang explore data from an online community that has been operating for 10 years in an effort to understand factors related to sustainability. On a longitudinal basis, they examined dynamic temporal development with respect to how the community formed, became robust, and was sustained. Emergent leaders, prolonged communication, and cross-boundary influence were found to have network effects that were relevant for participants' interactivities.

In *Analysis of the Twitter Interactions during the Impeachment of Brazilian President*, Fabricio Olivetti de Franca, Denise Goya, and Claudio Camargo Penteado analyze the retweeting relationships of many different types of individuals discussing the impeachment of the Brazilian President in 2016. They propose a method of studying recurrent patterns of communication to help understand the lack of propagation of ideas. Their findings indicate the interactions might not be discussions, but rather an imposition of ideas.